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ABSTRACT

A survey of research on teacher effectiveness (that is, whether what is taught is indeed that which produces improvement in student performance) reveals that very little is known about what makes a good teacher, a position that is becoming increasingly untenable as competency-based education is introduced. The main gap is in research into changes in pupils attributable to their teachers, empirical evidence that teachers are in fact effective. Two attempts at measuring teacher effectiveness--"expert" rating and process-product studies--have produced little in the way of valid findings. It can be seen, however, that, in practice, an effective teacher can be recognized not so much by what he does as by when he does it; that he can be recognized not by which competencies he possesses as by how many there are. Implied in this is that the effective teacher will differ from the ineffective teacher primarily in his control over the repertory of competencies he commands; in his ability to adapt his behavior to the pupils, the purpose, and the situation in which he operates; and most important of all in his ability to learn from his own experience, so that his competence is always increasing. The function of teacher education should be to communicate this repertory of competencies to the teacher trainee so that they may be used as needed. The major change in the content of teacher education by a shift to this approach would be an increased emphasis on inquiry training, on lifetime experimentation, and on continuing education. And the dependence on research would also increase, with the difference being that the teacher himself, systematically implementing research findings on his own behavior and assessing the effects it has on his pupils, will be the one who closes the gap between research and teacher education. (MJB)

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Performance-Based Teacher Education Project
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CLOSING THE GAP BETWEEN RESEARCH IN TEACHER EFFECTIVENESS AND THE TEACHER EDUCATION CURRICULUM

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All teacher education institutions may be assumed to share the same ultimate goal--that of preparing teachers who are effective in helping pupils to learn. In order to achieve such a goal, each institution selects a set of enabling objectives which are defined in terms of competencies that will contribute to a teacher's effectiveness, and then designs a program intended to help students acquire these competencies. Under this model, the validity of the competencies chosen as enabling objectives is a necessary precondition for the program to succeed in achieving its goal. A competency is valid if its possession increases a teacher's effectiveness; therefore, the ability to select a valid set depends on the existence of accurate information about the relationship between the competencies teachers possess and their effectiveness in promoting pupil learning.

The traditional role of research in teacher effectiveness has been to discover such relationships--to find out what a teacher must know and do in order to be effective. It is generally agreed that only competencies which can be shown empirically to be related to teacher effectiveness should be adopted as enabling objectives of teacher education.

It will be the purpose of this paper first to examine the adequacy of the research base which underlies current teacher education programs and then to discuss the usefulness of this model for teacher education and research in teacher effectiveness.

So far it must be said that the model has not worked: the gap between what is known about teacher effectiveness and what is taught as if it were known is critical. The proportion of the content of the teacher education curriculum that has been empirically shown to relate to teacher effectiveness is so small that if all of what is taught to students in preservice programs were eliminated except what research has validated there would be nothing left but a few units in methods of teaching. There is no empirical evidence (for instance) that achievement in college mathematics courses is related to the ability to teach mathematics in the schools. There is no empirical evidence that ability to write is related to the abil-

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ity to teach children to write. There is no empirical evidence that knowledge of the history of education (or even of the psychology of learning) is related to the ability to teach anything in the classroom.

The situation is not much better with respect to relationship between a teacher's performance--what he does--and teacher effectiveness than it is with respect to what he knows. Although it was possible as long ago as 1950 to locate over a thousand published articles on teacher effectiveness (Domas and Tiedeman, 1950), when Barr reviewed the quantitative studies in 1948 he could only locate 79 that could be regarded as really quantitative (Barr, 1948). Both he and Morsh and Wilder, in a later reexamination of the question (1954), concurred in the conclusion that up to that time nothing had been found that dependably distinguished effective teachers from ineffective ones.

In the past this conspicuous lack of a research base has not seemed to interfere with the operation of teacher education programs, although there has been some concern about the complete absence of empirical evidence that professionally trained teachers are more effective than untrained ones. Popham has even produced some evidence that no such difference exists (1971). But on the whole, the enterprise has seemed to operate to the satisfaction of everyone (except, significantly enough, the students) without benefit of research. Or has it?

Pressures (largely from outside teacher education) have recently led to a development which may make it impossible for teacher educators to ignore the gap between research and teacher education much longer. In an increasing number of states, legislative action has been taken which requires all teacher education programs to become "performance-based" in the near future. In a performance-based program, decisions about students are based, not on successful completion of prescribed courses of study, but on demonstration of competence to perform certain acts (Elam, 1971). In such a program, the duration and content of teacher education, and the modes of instruction used, are of minor interest; of major interest are the things a student knows and can do after being trained.

Teacher educators who operate in a performance-based program will be forced to specify their enabling objectives--which is to say, the competencies their students are expected to acquire--more precisely and in greater detail than in the past; and they will be under pressure to defend or validate each competence as relevant to the ultimate goal of improving teacher effectiveness.

As teacher educators in many parts of the country have begun to design performance-based programs, they have encountered this problem of validating the competencies they specify as program outcomes, and there is already an unprecedented demand for relevant re-

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search findings addressed to researchers in teacher effectiveness, a demand that the latter group are ill-prepared to satisfy.

How has it happened that despite the long history of research in teacher effectiveness so little is known about what makes a good teacher?

Research in teacher effectiveness--that is, research designed to develop increased understanding of effective teachers--began in the nineteenth century with the publication of a study with the title, "Characteristics of the Best Teachers as Recognized by Children" (Kratz, 1896). This seems to have been the first investigation of the problem that might be described as in any sense empirical. The use of the word *recognized* in the title, suggesting that even a child knows who is the best teacher, is an early manifestation of the universal belief that anyone can recognize a good teacher. This fallacy, which seems to be one of the deepest, most tenacious in our culture, was for a long time accepted even by research workers in the field.

The pioneer studies of teacher effectiveness consisted, like Kratz's, of efforts to compile and collate lists of characteristics of teachers whom students perceived as "good" teachers; and this approach was still in use as late as 1936 (Hart, 1936). The fatal flaw in the approach could have been spotted in the fact that only one trait (teaching skill) was mentioned by as many as half of the students in Hart's sample. This does not lend support to the idea that what makes a teacher effective is so obvious that anyone can see it. But the idea persisted.

This idea was soon modified slightly and it was assumed that it took an "expert" to recognize good teaching, and studies which used supervisors, professors of education, and the like instead of pupils began to appear (e.g., Anderson, 1917). The apotheosis of this type of research was the *Commonwealth Teacher Training Study* (Charters and Waples, 1929). The fact that the expertise of these people seems to have consisted mainly in familiarity with lists of traits compiled either by other experts or by pupils gave the whole enterprise a circular quality that seems obvious today but largely escaped the notice of researchers of the time.

The use of the structured rating scale in teacher evaluation seems to have begun at about this same time (Elliott, 1915); its use spread so rapidly that by 1930 there were at least 209 different ones in use in colleges and schools around the country, and a study comparing and collating the characteristics on which teachers were rated was reported (Barr and Emans, 1930). Once again, agreement about what an effective teacher was like was by no means universal. There were almost as many characteristics listed as there were rating devices. Only eight characteristics were included on as many as half of the scales.

Much of the apparent disagreement was, of course, more apparent then real, reflecting minor differences in wording. When the authors tried to combine similar characteristics differently expressed, they found that there was general agreement on such broad areas as *classroom management, instructional skill, scholarship, fitness for teaching,* and *ability to cooperate with others.* It was with respect to how these general areas of competence were to be defined that differences were found. Then, as now, experts could agree that teachers needed competencies in certain areas, but they could not agree on the nature of these competencies, or on the behavioral cues on the basis of which they could be recognized and assessed.

The basic defect in this entire line of research is, as has been suggested, that nowhere in the entire process was any actual measure of teacher effectiveness introduced--no measure of changes in pupils attributable to their teachers. No amount of collation and comparison of the opinions of observers about what an effective teacher is like can validate the opinions of any of them. What is needed, and what is entirely absent, is empirical data to indicate which teachers were in fact effective--that is, whose opinions were correct.

Quantitative studies relating competence of teachers to various other characteristics began to appear as early as 1905 (Meriam, 1905), but they were rare at least until 1948, when Barr made a survey of investigations into the measurement and prediction of teacher "efficiency" (as it was called in those days). Barr could only find 79 studies to review (Barr, 1948). Of these, 46 used supervisors' or principals' ratings of teacher effectiveness as a criterion, and 15 used grades in practice teaching. Such studies do not break the circle, of course, because they do not involve actual measurements of pupil change.

There were only 18 studies done during these 43 years which actually did include some sort of measure of changes in pupils--usually gains on achievement tests--as a criterion of teacher effectiveness. In a search for studies of teacher effectiveness using such criteria made 10 years later, Mitzel and Gross were able to find only 20 (Mitzel and Gross, 1958). Among over a thousand publications on teacher effectiveness published in a half a century (cf. Domas and Tiedeman, 1950), then, not more than 20, or two percent, involved actual measures of teacher effectiveness! This melancholy fact documents the wide-spread acceptance of the fallacy that anyone can judge teacher effectiveness. It also suggests why the research done up to around 1960 was so unproductive.

Direct evidence that this assumption was fallacious was available as early as 1935, when a number of correlations between "expert" ratings of teacher effectiveness and measures of pupil gains were reported (Barr, et al, 1935). The values ranged from

-.15 to +.36, and had a mean of +.16. A review of later studies which correlated "expert" ratings of teacher effectiveness with mean gains of their pupils found all of them unanimous in concluding that ratings and effectiveness are not significantly correlated (Medley and Mitzel, 1959). In the latest such review, which reports results from five additional studies, the median correlation was +.13, and only one of the ten reported was statistically significant (Rosenshine, 1971). The evidence that pupils learn just as much from teachers rated *ineffective* by experts as they do from teachers rated *effective* by the same experts is impressive, and has been verified again and again.

This finding calls into question practically all of the literature on the nature of teacher effectiveness published in the first half-century of educational research, since at least 98 percent of it was based entirely on "expert opinion."

Beginning around 1960, there was a noticeable increase in the frequency of "process-product" studies of teacher effectiveness--that is, studies in which both the "process" used by teachers and the "product" of their teaching are measured and correlated. The process of instruction is usually measured by direct observation, and the product is typically assessed by measuring mean gains of pupils on one or more achievement tests. Rosenshine (1971) and Rosenshine and Furst (1973), have located some fifty such studies, and have attempted to collate the results in the form of a list of "validated" teacher characteristics or competences (process variables). This list may be said to include all of the teacher characteristics that have so far been demonstrated to be related to teacher effectiveness (in the cognitive domain at least).

The list varies somewhat in the various versions cited; also, some critics have questioned the evidence for some or all of them (Heath and Nielson, 1973). Even if these matters are ignored, and the author's conclusions are accepted in the most uncritical way, they are far from impressive. No more than eleven characteristics have been identified as even probably related to teaching success in 75 years of research and hundreds of studies.

This hardly seems to provide an adequate research base for the professional part of a teacher education program--eleven competencies whose validity is at best questionable. Nor does it bode well for the future: if it has taken 75 years to get this far, how long will it take to construct an adequate base? And how much longer, then, must teacher education continue to operate on faith that what it is doing will someday be proven to have been correct?

The solution to the problem of making an honest woman of teacher education does not lie in this direction. Process-product studies of the type reviewed by Rosenshine and Furst cannot solve the problem in the foreseeable future, however rapidly they are produced. The solution lies in another direction, one in which teacher

education can move without waiting for researchers to lead them. It is time to abandon, not only the fallacious notion that anyone can recognize an effective teacher by watching him teach, but also a second, a subtler, fallacy which underlies it. It is time to question the widely believed, but almost certainly incorrect idea that there exists a single set of performance competencies--of skills and abilities--which all or nearly all effective teachers have, and which all, or nearly all ineffective ones lack. Research in teacher effectiveness has spent 75 years in a vain attempt to identify this imaginary set of competencies, and teacher educators have been trying to teach them to their students, without (of course) knowing what they are.

The simplistic assumption that all effective teachers achieve their effects in the same way--that they all act alike while they are teaching--was the basis of early efforts to get, first students, and then expert judges to describe the "best" teacher. The fact that neither pupils nor experts could agree on how the best teachers behaved was strong evidence that the best teachers did not all behave in the same way. But nobody questioned the assumption, nobody saw the evidence for what it was. Nobody seems to have considered the alternative: that teacher effectiveness is not a unidimensional trait but a very complex one. The fact is that, if a sample of teachers could be arranged in a room in such a way that teachers who behaved similarly in the classroom stood near each other, while teachers who behaved differently were farther apart, the best teachers in the group would be found all over the room, and so would the worst. The general assumption has been that the best teachers would all be in one corner and the poorest would all be together in the opposite corner. This assumption, once again, is not supported by the facts; and until it is abandoned, neither teacher education nor research in teacher effectiveness is likely to improve much.

Let us then (for a moment at least) abandon the notion that teacher effectiveness is a unidimensional trait, the idea that if only enough were known about process-product research it would be possible, not only to describe how the effective teacher behaves but also to teach students to behave in the same way and therefore become effective teachers. Let us instead consider adopting a definition like one proposed by Joyce and Harootunian some time ago:

> While we are not at all certain what . . . combination of qualities makes a good teacher, the potentially better teacher is one who is able to plan and control his professional behavior--to teach many kinds of lessons, to reach many diverse learners, to create different climates and to adapt a wide range of teaching strategies to constantly changing conditions (1967, p. 94).

This definition implies that an effective teacher can be recognized, not so much by what he does as by when he does it; that he can be recognized not by which competencies he possesses so much as by how many there are. It also implies that the effective teacher will differ from the ineffective teacher primarily in his control over the repertory of competencies he commands; in his ability to adapt his behavior to the pupils, the purpose, and the situation in which he operates; and most important of all in his ability to learn from his own experience, so that his competence is always increasing. This definition views teacher competence as a dynamic rather than a static thing. a direction in which one moves rather than a point at which one arrives.

The function of process-product research is no longer seen as that of finding out which competencies a teacher should learn to use, and which he should ignore; the function of such research is to provide information which will help the teacher decide which competency is likely to be useful in a given instance. It will accomplish its purpose by asking, not which procedure effective teachers use most frequently, as it does now; but instead it will ask under what conditions an effective teacher uses this procedure, for what purposes, with what kind of pupils, and so on. Medical research does not concern itself with whether the best doctors use penicillin more often than, say, cortisone; it concerns itself with what penicillin is good for, and what parameters or conditions determine its effects; as well as with what cortisone is good for and what parameters determine its effects. Educational research should likewise cease to ask whether good teachers teach more enthusiastically than poor ones; instead it should ask what effects teacher enthusiasm has with what type of pupil, under what conditions.

Chances are that every competency listed in the fifty studies reviewed by Rosenshine, et al (1971, 1973), is effective for some purpose, with some teachers and some classes. What a teacher needs to know is when, how, with whom, and for what purpose each competency is most likely to be effective. This is what future research in teacher effectiveness should produce: descriptive information rather than the largely useless, value-laden "validity" data it has sought to produce in the past.

And the function of teacher education, insofar as classroom performance is concerned, should be to communicate this information to its students. The graduate of a teacher training program should be able to demonstrate a wide repertory of competencies, carefully selected to include the most useful ones known; he should also know the parameters which determine the effects of each one--or at least should have the best available information about these parameters. There is no guarantee that his repertory and his knowledge is adequate to ensure his success on the job; but they should provide him with the best chance that present knowledge can give him.

There is a sense in which it may be said that the adoption of this position need not change the content of teacher education at all. However, it does involve important changes in how this content is viewed both by the teacher educator and the teacher education student.

The teacher educator no longer needs to claim infallibility--to maintain that he possesses the secrets of success in teaching. His only claim is that he has assembled in the curriculum he teaches what is most likely to be useful--the best information available relating to the problems the teacher will face. It is more than ever his responsibility to keep up with the research, to evaluate it, to select the most important conclusions, and so on. But he is no longer in the false position to having to act as though his knowledge were sufficient to meet all of the needs of his students.

The teacher education student should become more realistic in his expectations, and the "reality shock" many students now experience in their first year should be less severe. The student should realize that teacher competence is something one acquires bit by bit, more rapidly (perhaps) after graduation than before. He should understand that his college professors cannot teach him everything he needs but only what they know; and that eventually he is the only one who can supply the rest.

Perhaps the teaching profession should adopt the expression used by the medical profession, and say that after a teacher graduates and is certified, he begins to *practice* the profession of teaching, instead of saying that he begins to *teach*. For it is only when a teacher begins to practice that he can begin to sort out among the competencies he has acquired in pre-service training those that work for him from those that do not; or, more accurately, to discover when, with whom, and for what purpose each competence is effective for him.

The major change in the content of teacher education that is implied by the change from the unidimensional model of teacher effectiveness to what might be called the idiosyncratic one would seem to be an increased emphasis on inquiry training, a much greater emphasis on preparing each teacher for a lifetime of experimentation, of efforts to continually refine his competence. More training will be needed in methods of analyzing teaching behavior and assessing its effects on pupils, that is clear. Training will also be needed in the rudiments of the scientific method, in such things as relating experience to theory, assessing the dependibility of results.

The importance of research in teacher effectiveness will by no means diminish; in fact, as has been suggested, the demand for empirical data indicating how teacher behavior is related to pupil learning will increase. Teacher education will be fully as

dependent on research results as ever, the dependency will be more explicit than ever, and the relationship will be more honest and more productive. It is to be hoped that, even if no crash program of research is initiated, there will be a substantial and continuing increase in organized research in teacher effectiveness until the gap between what we know and what we need to know is much smaller.

But the most vital link in the process of improving teacher effectiveness is not the research worker, or the teacher educator, but the teacher himself, systematically implementing research findings in his own behavior and assessing the effects it has on his pupils. The only one who can finally close the gap between research and teacher education is the teacher himself.

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